United States Department of Agriculture
Forest Service
NA-Morgantown

File Code: 3400 **Date:** October 25, 1999

Subject: Black Cherry Decay indicators from the 1998 ANF-FHM plots

To: Bob White, Silviculturist, ANF

Bob, the attached sheets constitute a preliminary review of the data Bob Acciavatti and I obtained when we re-assessed six of the 1998 FHM plots on the ANF. This summary was produced to provide us information to share on the National FHM staff tour of the ANF. **General Conclusion: Bob and I found the data to be generally acceptable, and believe it accurately reflects the damage seen in the trees.** However, we felt that the system could be modified to better meet the needs of the ANF and have some plans for future work that should give us a better understanding of basal rot in intensively managed black cherry stands.

Background

Dan Twardus related to us that in comparison to the regional the FHM data set the level of tree damage (as represented by damage indicators) recorded in the 1998 ANF FHM plots was, higher than expected. On scanning the plot data both Dr's Stout and Horsley, (Forest Science Lab, Warren PA) commented that the reported level of damage reflected what they would have expected to see for the ANF.

Having spent some time with the 1999 FHM plot crew, I was convinced that in 1999, the data will accurately reflect the health of the forest trees.

To evaluate the 1998 plot data, Dr. Bob Acciavatti first created Table 1 (attached). It provides a break down of the 36 plots and their black cherry component. High-lighted in this table are the six plots we subsequently re-assessed. The six pages following the table were extracted from the 1998 FHM data and provide the black cherry tree data. We have restricted the data set to the, location, code and severity of the first three damages. Printed in red are any errors of *fact or interpretation* that we discovered. An accompanying two pages provides our field sketches of a few of the reviewed trees.

Findings

We found the data to be generally acceptable, and believe it accurately reflects the damage seen in the trees. The amount of red ink on the plot sheets is a reflection of interpretations and not of errors of fact made by the field crew. If you will allow me to take a metaphor from professional football;

"After further review, the call made on the field *sheets* stands. We saw no incontrovertible evidence to change the call."

Yes, two trees were overlooked and one came back to life. However, field data is never perfect and I am willing to accept some level of errors.

Discussion

I believe that the claim, *that the level of damage on the ANF is higher than expected*, can be explained. If the National FHM data contains a lot of plots from unmanaged or from stands arose after a clear cutting then the ANF FHM damage data will appear to be excessive. Some of the damage we observed is attributable to "repeated stand entry". Every time a stand is entered, for a silvicultural purpose, a small percentage of the stems accumulate another damage. "Pivot trees" on skidder trails loose another piece of bark and the resulting wound will eventually lead to decay. "Old Timers" on the ANF maintain that Red Rot of Black Cherry is worse in some stands than in others. A retired saw miller maintains that basal red rot is worst in some stands that had a TSI treatment many years ago.

At one time a machine known as "the little beaver" was used to ring bark all but one of the stems in an individual stump sprout cluster. The machine consisted of a small backpack mounted petrol engine that powered a flexible drive shaft attached to a cutting head. This machine was used to girdle the unwanted stump sprouts. An axe could and frequently did as good a job as the beaver. Several of the examined plots were in stands that had been both axe-TSI treated and thinned. Plot 111, was the best example of this type of stand. The field sketch of plot 111, sub 4, trees 11, 1, & 2 depicts the result of a stump sprouting. In this case we have 3 living, 3dead, and one axe cut stem that were all once attached to the same stump. The question to be answered is; "Just how good is black cherry at compartmentalization?" If the TSI operation was carried out in a season that was favorable to the rapid development of wood decay then it is likely that the TSI-ed stems would have basal decay columns attached to those in the now dead spars. If the TSI operation had been carried out in the winter or late fall I suspect that the natural compartmentalization ability of the black cherry would have walled off most decays.

I have taken the liberty of including some data from an as yet unfinished report on stump rot of black cherry. Some field sketches are provided as my suggestion of what many of the stumps will look like when the resurveyed stands are harvested. Production unit 4 of the James Mill timber sale on the ANF was of a stand that had been TSI-ed using a mixture of axe and beaver girdling of stump sprouts. In a survey of stump surface decay I found that although rot was recorded from 39% of the stumps, only 15% of the stumps had a level of cross sectional area decay of greater than 2% (*MacKenzie unpublished*). Clearly in this stand, at the time of the TSI operation the prevailing conditions had favored compartmentalization of the cherry and basal rot had been contained to a minimum. Two pages of field stump sketches are provided to give an idea of what the stumps of the sampled stands might look like when harvested.

Robert Acciavatti and I developed the included data sheets and sketches in our assessment of the level of damage of black cherry trees in six of the 1998 FHM ANF plots. We have some ideas of what we should do next and look forward to discussing them with you on the upcoming National FHM tour of the ANF.

Marin MacKenzie
Pathologist
For Bob Acciavatti
Entomologist
FHP

1998 ANF FHM Black Cherry Decay Indicators
Number and Percent of Black Cherry Trees per plot
with Bole Decay Indicators (TRDAM 2 at TRLOC 1 or TRLOC 2)

Observation	Plot (1042-)	Total No. Black Cherry	No. with Decay Indicators	Percent with Decay Indicators
1	005	10	4	40
2	007	4	1	25
3	011	1	0	0
4	012	7	1	14
5	020	0	0	0
6	023	25	6	24
7	027	34	11	32
8	031	9	2	0
9	034	16	4	25
10	037	0	0	0
11	038	0	0	0
12	043	12	2	17
13	048	3	1	33
14	054	4	0	0
15	057	4	0	0
16	061	18	9	50
17	063	11	3	27
18	074	5	2	40
19	078	8	0	0
20	083	7	2	28
21	084	12	1	8
22	093	3	2	66
23	095	35	7	20
24	096	10	3	30
25	098	2	0	0
26	105	27	0	0
27	111	27	6	22
28	114	18	2	11
29	117	15	0	0
30	118	2	0	0
31	119	13	5	38
32	141	1	0	0
33	143	3	1	33
34	157	7	0	0
35	160	0	0	0
36	163	6	0	0

Table 1 Plots selected for an evaluation of the Black Cherry damage data

PLOT 23

tree #	curhist	DBH	dam 1	loc 1	svty 1	dam2	loc 2	svty 3	dam3	loc 3	svty 3
sub 1											
1	1	10.5	1	3	4	1	5	3			
4	1	13.8	2	2	0						
		We observed a 6-8" crack reaching the ground and obvious mycelial fans = 2@2									
5	5	7.5									
					It is still dead						
7	1	18.6									
8	1	14.2	2	2	0	1	3	5	22	7	6
1	1	11.8	3	5	2						
sub2											
4	1	8.4	1	3	4						
5	1	12.9	2	1	0	22	7	5			
7	1	15.7									
8	5	7.1									
9	5	8.8									
10	5	5.9									
11	1	15.2	2	2	0	1	3	9			
		we observed extensive carpenter ant damage up as high as 2'									
sub 3											
1	5	5.9									
2	1	14.4	4	3	2						
3	1	12.7	2	2	0						
		we observed a piece of exposed elipse wood 6x1 inches									
4	1	8.9									
5	5	8.6									
6	5	10.5									
7	1	11.8	5	2	0						
8	1	11.4									
sub 4											
4	1	14.1	1	7	5						
5	1	22.2	22	7	2						
10	5	13.1									
11	1	14.7	2	3	0						

SUMMARY : We found no discrepancies in this plot

PLOT 27

tree #	curhist	DBH	dam 1	loc 1	svty 1	dam 2	loc 2	svty 2	dam 3	loc 3	svty 3
sub 1											
1	1	4.9									
2	1	4.9									
3	1	2.5	2	2	0						
	Basal rot observed and despite the small DBH the call is correct										
4	1	4.1									
5	5	5									
6	1	5.8									
7	1	5.4									
	Trees 6 and & 7 are of stump origin and joined at ground level and include a dead spar										
	the dead 8" spar is extensively decayed.										
	The question : Is decay column joined to either of the living stems?										
8	1	5.4									
9	1	6.8									
sub 2											
1	1	1.4	1	7	3						
2	1	1.3	2	1	0	1	7	5			
3	1	2.1									
4	1	5.3									
5	1	8.1									
	Trees 4 & 5 are of stump origin and joined at ground level										
	They have an included dead spar with extensive decay and carpenter ant damage										
6	1	8	2	2	0						
7	1	7.5	2	2	0	22	7	3			
8	1	7.3									
sub 3											
1	1	1.8	21	6	1						
2	5	6.3									
3	1	6.7	3	3	3	21	6	6			
4	1	9	2	2	0						
5	1	7.9	2	2	0						
6	1	5.8	2	2	0	This is the first trees on which there					
7	1	7.8	2	2	0	there was any missed data					
8	1	6.5									
12	1	7.4	2	2	0						
sub 4											
3	1	5.3									
4	1	6									
5	1	6.9	2	3	0						
6	1	5.8	2	1	0						
7	1	5.8	2	2	0						
8	1	8.3	2	2	0						
	trees 5, 6, 7, & 8 are of stump origin and joined at ground level										
9	1	8.2	*see diagrams*								
10	1	5.5									

Summary We found two trees that had been omitted from the data.

PLOT 61

tree #	cur hist	DBH	dam 1	loc 1	svty 1	dam 2	loc 2	svyt 2	dam 2	loc 3	svyt 3
sub 1											
3	1	11.7	2	2	0						
4	1	8.8	2	2	0	22	7	5			
5	1	9.7	2	2	0						
		Trees 3, 4, & 5 all originated from the same stump and it is decayed									
6	1	15.4									
7	1	8.1	22	7	6						
9	5	8.1									
sub 2											
1	5	11.9									
3	5	10.3	This tree is alive with a decay free bole								
5	1	21.9	2	2	0						
13	1	10.3									
14	1	8.3	1	3	4	1	5	4	22	7	5
15	1	11.1	2	3	0	1	3	2			
sub 3											
1	1	9.9	2	3	0						
2	1	14.2	1	3	7	2	4	0			
3	1	12	2	2	0						
13	1	11.1	1	3	5	2	3	0			
sub 4											
2	1	13.2	2	2	0	1	3	3	22	7	3
10	1	14.5									

SUMMARY Only one error found

However, it would have been possible to code some of the damage slightly differently, i.e. is it stump and lower bole or just lower bole?

PLOT 95

tree#	cur hist	DBH	dam 1	loc 1	svty 1	dam 2	loc 2	svty 2	dam 3	loc 3	svty 3
sub1											
1	1	3.1									
2	1	7									
3	1	7.2									
4	1	5.5	2	2	0						
5	1	8.3									
6	1	6.1									
7	1	8.4									
8	1	7.8									
9	1	7.1									
11	1	5.2	2	3							
13	1	5.5	2	3	0						
15	1	6.4	2	3	0						
16	1	8.4									
17	1	7.4									
18	1	8.4	*see diagrams*								
sub 2											
	no BC										
sub3											
1	1	3.9	1	5	7						
4	1	6.3									
5	1	6.4									
6	1	5.4									
7	1	5.7	2	3	0						
8	1	6.6	2	4	0						
9	1	6	21	6	1						
10	1	5.9									
11	1	7.6									
13	1	7.5									
14	1	8.3	2	3	0						
15	1	5.7									
16	1	6	2	3	0						
17	1	12.2									
sub 4											
6	1	8.7									
7	1	6.7									
8	1	10.1	1	3	5						
			2	3	**We called this 2 @ 3 as the tree sounded hollow under intact but, loose bark. It looked like old bird peck that had callused over**						
9	1	11									
10	1	6.4									
11	1	6.4									

SUMMARY : Data is acceptable

PLOT 111

tree #	curhist	DBH	dam 1	loc 1	svty 1	dam 2	loc 2	svty 2	dam 3	loc 3	svty 3
sub 1											
2	1	13.9	5	2	0						
			2	2		We thought the crack had decay in it					
3	1	14.5									
			trees 2 & 3 are from the same stump origin								
4	5	6									
7	1	12.4									
8	1	10.6	2	2	0						
			trees 7& 8 are from the same stump origin								
9	1	11.3	2	2	0						
11	1	10.9									
sub 2											
4	1	11.3									
5	1	7.6	2	2	We thought the decay in the attached spar reached the main stem *see diagram*						
6	1	9.8									
7	1	6.2	3	1	4	22	7	5			
9	1	11.3	5	3	0						
10	1	10.8									
			trees 9 &10 are from the same stump origin *see diagram*								
sub 3											
1	5	7									
2	1	15	2	2	0	*see diagram*					
3	1	15									
4	5	8.7									
5	1	12.8	2	1	0						
6	1	13	1	3	5						
8	1	11.1									
sub 4											
1	5	5.7									
2	5	9.2									
4	5	8.1									
5	1	11.1	2	1	0	3	2	4	22	7	5
6	1	11.7	1	3	5						
			trees 5 & 6 are from the same stump origin *see diagram*								
8	5	5.9									
11	1	12.8	2	2	0						
			trees 1, 2, & 11 are from the same stump origin *see diagram*								

SUMMARY : Data is acceptable

PLOT 119

tree #	cur his	DBH	dam 1	loc 1	syvt 1	dam 2	loc 2	svyt 2
sub 1								
3	1	21.8	2	3	0	22	7	3
5	1	24.7	5	3	0	2	7	5
			2	1	While we would have called 2 @ 1 we missed their 5 @ 3			
sub 2								
1	1	20.5	5	2	0	2	3	0
4	1	18.7	5	2	0	22	7	3
5	1	19.5						
7	1	17	1	5	9			
		Trees 4, 5, & 7 all have a large dead snag branch and while the book page 3-13 states "snag branches are ignored and not coded as dead" we suspect that for BC at least this will result in an underestimate of log value ***						
sub 3								
5	1	17.8	2	2	0			
8	1	20.3	5	3	0	22	7	3
9	1	18.5	5	2	0	5	3	0
			2	3	We maintain that 2 @ 3 is a better call; woodpecker damage, although small exposed decayed wood.			
sub 4								
3	1	24.2	5	2	0			
4	1	21	22	7	3			
5	1	19.5	2	1	we saw rot in a lateral root probably below threshold			
7	1	23.9	2	3	0			

SUMMARY : Data is acceptable

*** see first sketch in diagrams

Figure Diagrams of some selected trees

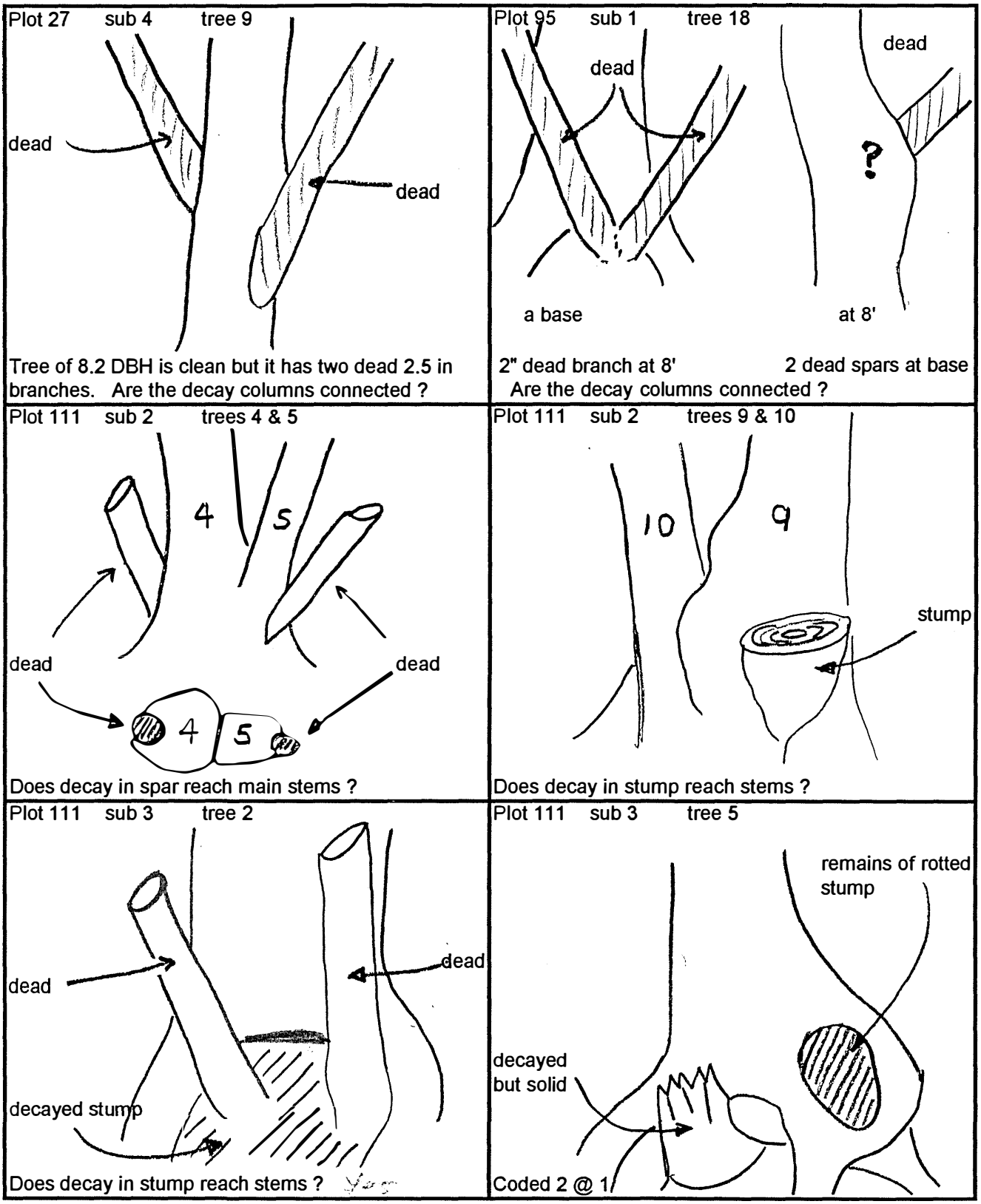
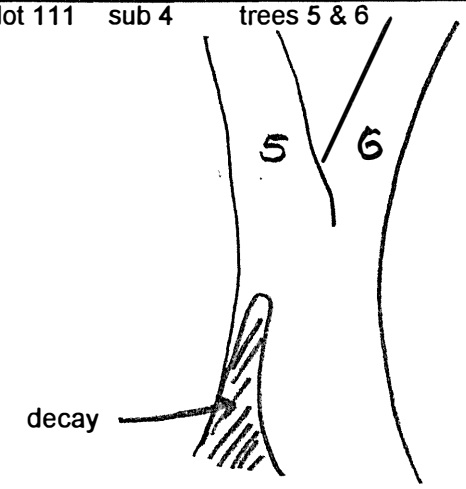


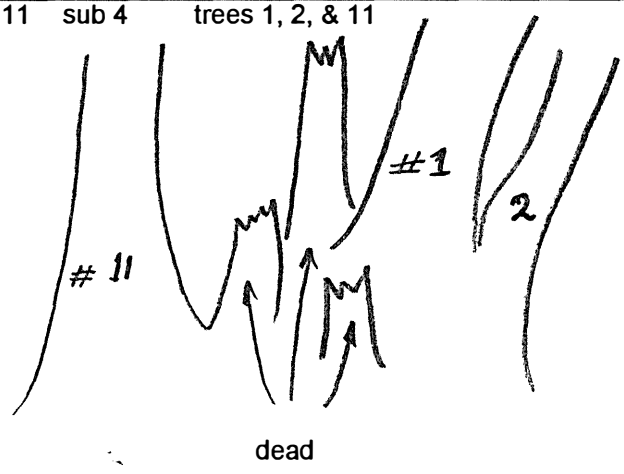
Figure Diagrams of some selected trees

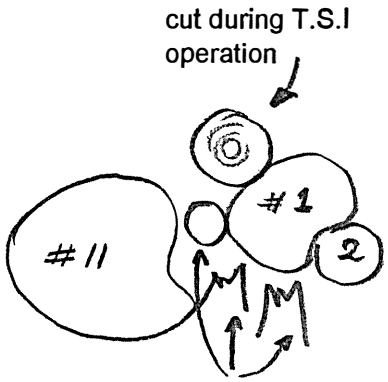
Plot 111 sub 4 trees 5 & 6



Is decay in tree 5 connected to tree 6 ?

Plot 111 sub 4 trees 1, 2, & 11





tree 11 was coded 2 @ 2. Three living stems, three dead stems and one stump all connected below ground Are the rot columns connected?

"Little Beaver used to girdle unwanted sprouts"

from L. C. Walkers
The North American Forests- geography, ecology, and silviculture

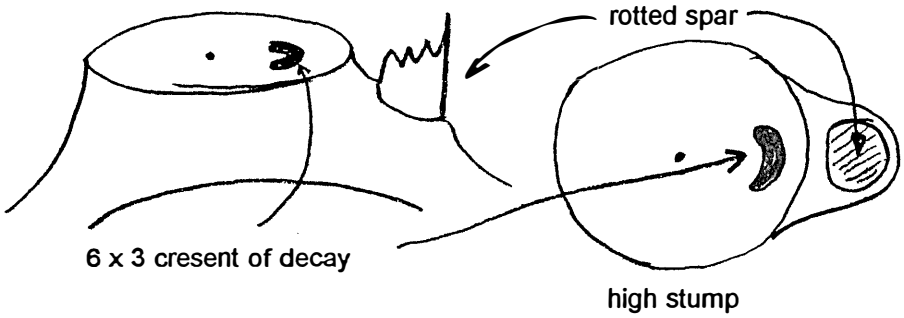
226

(c)

Field sketches of stumps found in the James Mill timber sale

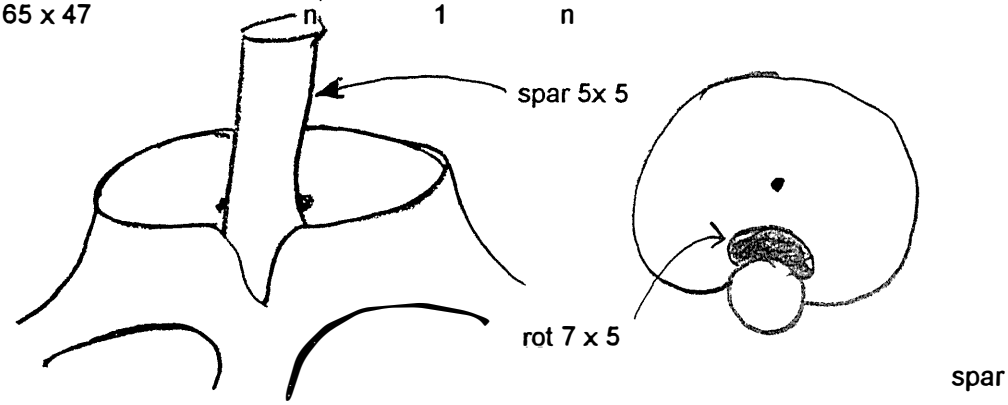
(dimensions in cms)

stump #	tag #	iams in cm	sprouts	piths	included bark
30	743	37 x 36	y	1	n



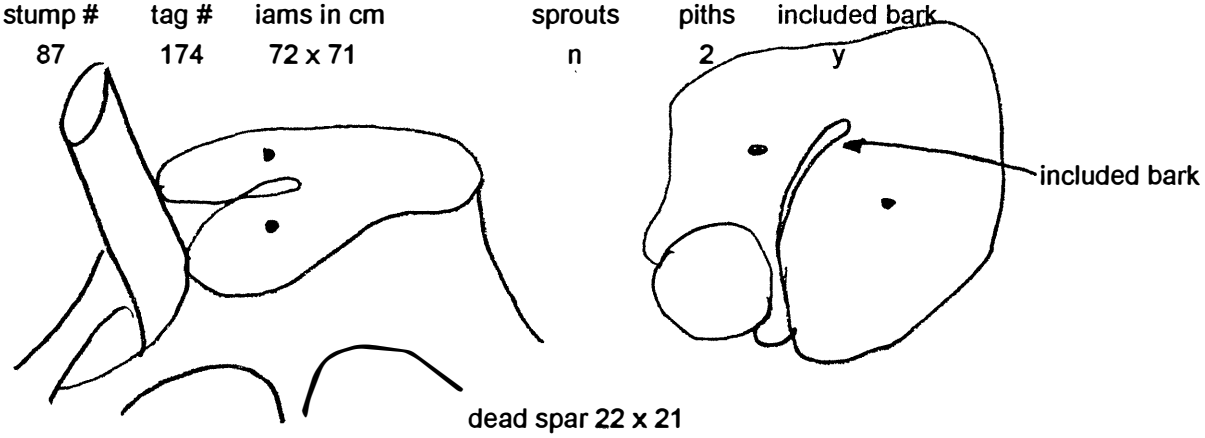
Is the decay column in the stump connected to that in the spar?

stump #	tag #	iams in cm	sprouts	piths	included bark
31	156	65 x 47	n	1	n



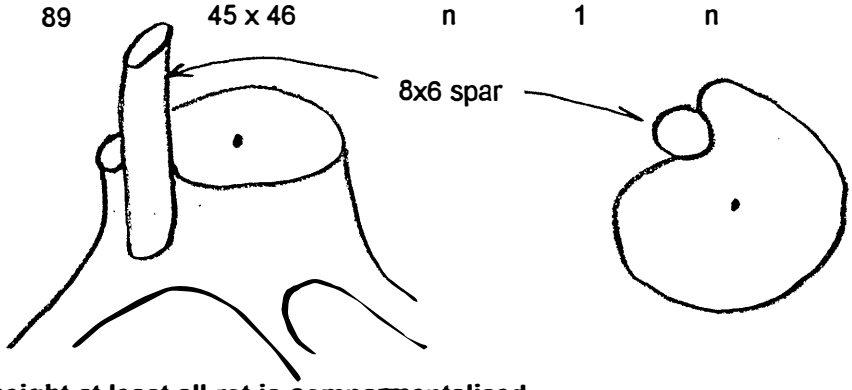
Is the decay column in the stump connected to that in the spar?

stump #	tag #	iams in cm	sprouts	piths	included bark
87	174	72 x 71	n	2	y



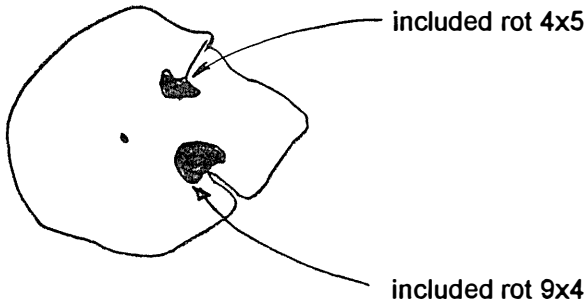
The great majority of stumps have no deacy exposed on the cut surface!

stump #	tag #	diams in cm	sprouts	piths	included bark
65	89	45 x 46	n	1	n



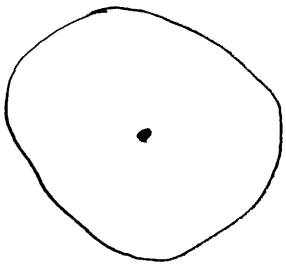
At stump height at least all rot is compartmentalised.

stump #	tag #	diams in cm	sprouts	piths	included bark
66	859	74 x 70	n	1	y



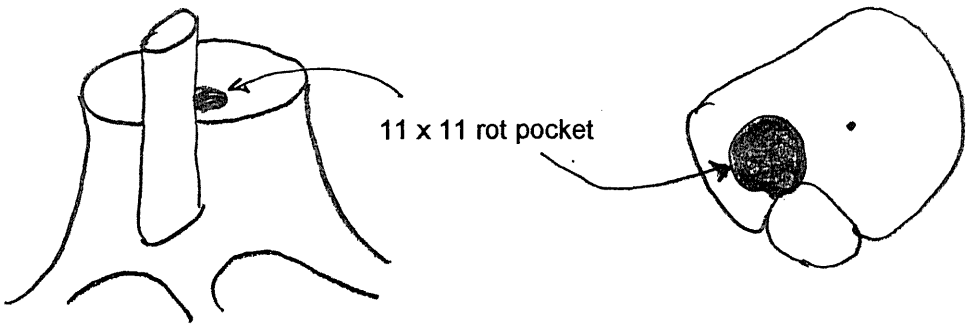
Two columns of rot and no spars.

stump #	tag #	diams in cm	sprouts	piths	included bark
67	36	? X?	n	1	n



69 % of all stumps had no obvious rot at stump height.

stump #	tag #	diams in cm	sprouts	piths	included bark
68	72	40 x 40	y	1	n



Is decay in spar connected to rot in stump ?